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In re Application of: George P. Lomonosoff *et al.*

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Entitled: **Modified Plant Viruses as Vectors of
Heterologous Peptides****CERTIFICATE RE: SEQUENCE LISTING**Assistant Commissioner for Patents
Washington, D.C. 20231**CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8(a)(1)(I)(A)**

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Dated: 9/13/00By: Traci E. Light

Traci E. Light

Sir or Madam:

I hereby state that the enclosed Sequence Listing is being submitted in paper copy and on a computer-readable diskette, and that the content of the paper and computer readable copies are the same.

Dated: 9/13/2000By: Peter G. Carroll

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SEQUENCE LISTING

<110> Lomonossoff, George P.
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Bendig, Mary
Jones, Tim
Longstaff, Marian

<120> Modified Plant Viruses as Vectors of Heterologous Peptides

<130> DOW-04646

<140> 09/304,967

<141> 1999-05-05

<150> 08/471,048

<151> 1995-06-06

<150> 08/612,858

<151> 1996-03-12

<150> 08/137,032

<151> 1993-03-18

<150> PCT/GB20/00589

<151> 1992-04-02

<160> 123

<170> PatentIn Ver. 2.0

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<213> Cowpea mosaic virus

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<213> Cowpea mosaic virus

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1 5 10 15

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20 25 30

Asp Leu Ile Asn Gly Lys Ile Thr
35 40

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<211> 27

<212> PRT

<213> Foot-and-mouth disease virus

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 1 5 10 15

Val Leu Ala Gln Lys Val Ala Arg Thr Leu Pro
 20 25

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 <213> Foot-and-mouth disease virus

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 aaaaggttgc tcggactctt c 81

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 <212> DNA
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 ccaacgagcc tgagaaggat c 81

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 <211> 52
 <212> PRT
 <213> Foot-and-mouth disease virus

<400> 6
 Gly Pro Val Cys Ala Glu Ala Ser Asp Val Tyr Ser Pro Cys Met Ile
 1 5 10 15

Ala Ser Thr Tyr Ser Arg Asn Ala Val Pro Asn Leu Arg Gly Asp Leu
 20 25 30

Gln Val Leu Ala Gln Lys Val Ala Arg Thr Leu Pro Ser Thr Pro Pro
 35 40 45

Ala Pro Phe Ser
 50

<210> 7
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 <212> DNA
 <213> Foot-and-mouth disease virus

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 cggactcttc ctagactcc tctgtctcca ttttca 156

<210> 8
 <211> 52
 <212> PRT
 <213> Foot-and-mouth disease virus

<400> 8
 Tyr Ser Pro Cys Met Ile Ala Ser Thr Tyr Ser Arg Asn Ala Val Pro
 1 5 10 15

Asn Leu Arg Gly Asp Leu Gln Val Leu Ala Gln Lys Val Ala Arg Thr
 20 25 30

Leu Pro Ser Thr Pro Pro Ala Pro Phe Ser Asp Val Thr Ala Val Thr
 35 40 45

Phe Asp Leu Ile
 50

<210> 9
 <211> 156
 <212> DNA
 <213> Foot-and-mouth disease virus

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 tatagcccat gtatgatagc tagcacttat agtagaaatg ctgttcctaa ttgagagga 60
 gatcttcaag ttttggctca aaagggtgct cggactcttc ctagcactcc tcctgctcca 120
 ttttcagacg ttacagcagt aacttttgac ttaatc 156

<210> 10
 <211> 156
 <212> DNA
 <213> Foot-and-mouth disease virus

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 ctagaagttc aaaaccgagt tttccaacga gcctgagaag gatcgtgagg aggacgaggt 120
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<220>
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 Pro Cys Met Ile Ala Ser Thr Pro Pro Ala Pro Phe Ser Asp Val Thr
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Ala Val Thr Phe Asp Leu Ile
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 <213> Artificial Sequence

<220>
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 gacttaatc 69

<210> 13
 <211> 69
 <212> DNA
 <213> Artificial Sequence

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 gacttaatc 69

 <210> 14
 <211> 21
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic

 <400> 14
 Ser Thr Asp Arg Pro Glu Gly Ile Glu Glu Glu Gly Gly Glu Arg Asp
 1 5 10 15
 Arg Asp Arg Ser Asp
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 <210> 15
 <211> 67
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic

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 cggacgt 67

 <210> 16
 <211> 59
 <212> DNA
 <213> Artificial Sequence

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 <210> 17
 <211> 47
 <212> PRT
 <213> Artificial Sequence

 <220>
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<400> 17
 Gly Pro Val Cys Ala Glu Ala Ser Asp Val Tyr Ser Pro Cys Met Ile
 1 5 10 15
 Ala Ser Thr Asp Arg Pro Glu Gly Ile Glu Glu Glu Gly Gly Glu Arg
 20 25 30
 Asp Arg Asp Arg Ser Asp Val Thr Ala Val Thr Phe Asp Leu Ile
 35 40 45
 <210> 18
 <211> 141
 <212> DNA
 <213> Artificial Sequence
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 cgccctgagg gcatcgagga agagggcggg gagcgcgatc gtgatcggtc ggacgtcaca 120
 gcagtaactt ttgacttaat c 141
 <210> 19
 <211> 16
 <212> PRT
 <213> Artificial Sequence
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 <223> Description of Artificial Sequence: Synthetic
 <400> 19
 Ser Thr Pro Ala Thr Gly Ile Asp Asn His Arg Glu Ala Lys Leu Asp
 1 5 10 15
 <210> 20
 <211> 52
 <212> DNA
 <213> Artificial Sequence
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 <223> Description of Artificial Sequence: Synthetic
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 <210> 21
 <211> 44
 <212> DNA
 <213> Artificial Sequence
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 <400> 21
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<210> 22
<211> 42
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 22
Gly Pro Val Cys Ala Glu Ala Ser Asp Val Tyr Ser Pro Cys Met Ile
1 5 10 15
Ala Ser Thr Pro Ala Thr Gly Ile Asp Asn His Arg Glu Ala Lys Leu
20 25 30
Asp Val Thr Ala Val Thr Phe Asp Leu Ile
35 40

<210> 23
<211> 126
<212> DNA
<213> Artificial Sequence

<220>
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gctactggaa tcgataatca tagagaagct aaattggacg tcacagcagt aacttttgac 120
ttaatc 126

<210> 24
<211> 39
<212> PRT
<213> Foot-and-mouth disease virus

<400> 24
Tyr Ser Pro Cys Met Ile Ala Ser Thr Val Pro Asn Leu Arg Gly Asp
1 5 10 15
Leu Gln Val Leu Ala Gln Lys Val Ala Arg Thr Leu Pro Asp Val Thr
20 25 30
Ala Val Thr Phe Asp Leu Ile
35

<210> 25
<211> 117
<212> DNA
<213> Foot-and-mouth disease virus

<400> 25
tatagcccat gtatgatagc tagcactgtt cctaatttga gaggagatct tcaagttttg 60
gctcaaaagg ttgctcggac tcttcttgac gtcacagcag taacttttga cttaatc 117

<210> 26
<211> 117
<212> DNA
<213> Foot-and-mouth disease virus

<400> 26
 atatcgggta catactatcg atcgtgacaa ggattaaact ctcctctaga agttcaaaac 60
 cgagttttcc aacgagcctg agaaggactg cagtgtcgtc attgaaaact gaattag 117

<210> 27
 <211> 5
 <212> PRT
 <213> Foot-and-mouth disease virus

<400> 27
 Ser Thr Pro Pro Ala
 1 5

<210> 28
 <211> 17
 <212> DNA
 <213> Foot-and-mouth disease virus

<400> 28
 ctagcactcc tcctgct 17

<210> 29
 <211> 13
 <212> DNA
 <213> Foot-and-mouth disease virus

<400> 29
 gtgaggagga cga 13

<210> 30
 <211> 4
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 <213> Foot-and-mouth disease virus

<400> 30
 Pro Phe Ser Asp
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<210> 31
 <211> 14
 <212> DNA
 <213> Foot-and-mouth disease virus

<400> 31
 ccattttcag acgt 14

<210> 32
 <211> 10
 <212> DNA
 <213> Foot-and-mouth disease virus

<400> 32
 ggtaaaagtc 10

<210> 33
 <211> 19
 <212> PRT
 <213> Foot-and-mouth disease virus

<400> 33
 Val Pro Asn Leu Arg Gly Asp Leu Gln Val Leu Ala Gln Lys Val Ala
 1 5 10 15
 Arg Thr Leu

 <210> 34
 <211> 57
 <212> DNA
 <213> Foot-and-mouth disease virus

 <400> 34
 gttcctaatt tgagaggaga tcttcaagtt ttggctcaaa aggttgctcg gactctt 57

 <210> 35
 <211> 57
 <212> DNA
 <213> Foot-and-mouth disease virus

 <400> 35
 caaggattaa actctcctct agaagttcaa aaccgagttt tccaacgagc ctgagaa 57

 <210> 36
 <211> 14
 <212> PRT
 <213> Foot-and-mouth disease virus

 <400> 36
 Lys Asp Ala Thr Gly Ile Asp Asn His Arg Glu Ala Lys Leu
 1 5 10

 <210> 37
 <211> 42
 <212> DNA
 <213> Foot-and-mouth disease virus

 <400> 37
 aaagatgcta ctggaatcga taatcataga gaagcaaaat tg 42

 <210> 38
 <211> 42
 <212> DNA
 <213> Foot-and-mouth disease virus

 <400> 38
 tttctacgat gaccttagct attagtatct cttcgtttta ac 42

 <210> 39
 <211> 22
 <212> PRT
 <213> Foot-and-mouth disease virus

 <400> 39
 Pro Arg Gly Pro Asp Arg Pro Glu Gly Ile Glu Glu Glu Gly Gly Glu
 1 5 10 15
 Arg Asp Arg Asp Arg Ser
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<210> 40
 <211> 66
 <212> DNA
 <213> Foot-and-mouth disease virus

 <400> 40
 cctagaggac cagacagacc tgaaggaata gaagaggaag gtggagaacg cgatcgagat 60
 agatca 66

 <210> 41
 <211> 66
 <212> DNA
 <213> Foot-and-mouth disease virus

 <400> 41
 ggatctcctg gtctgtctgg acttccttat cttctccttc cacctcttgc gctagctcta 60
 tctagt 66

 <210> 42
 <211> 13
 <212> PRT
 <213> Soybean mosaic virus

 <400> 42
 Met Glu Gly Gly Ser Ser Lys Thr Ala Val Asn Thr Gly
 1 5 10

 <210> 43
 <211> 39
 <212> DNA
 <213> Soybean mosaic virus

 <400> 43
 atggaaggag gatcatctaa gactgctgtg aacactggg 39

 <210> 44
 <211> 39
 <212> DNA
 <213> Soybean mosaic virus

 <400> 44
 atggaaggag gatcctctaa gactgctgtg aacactggg 39

 <210> 45
 <211> 39
 <212> DNA
 <213> Soybean mosaic virus

 <400> 45
 atggaaggag gatcatctaa gactgctgtt aacactggg 39

 <210> 46
 <211> 16
 <212> PRT
 <213> Homo sapiens

 <400> 46
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 1 5 10 15

<210> 47
 <211> 48
 <212> DNA
 <213> Homo sapiens

 <400> 47
 ggtgttactt ctgctcctga tactagacct gctcctgggt ctactgct 48

 <210> 48
 <211> 48
 <212> DNA
 <213> Homo sapiens

 <400> 48
 ccacaatgaa gacgaccact atgatctgga cgaggaccaa gatgacga 48

 <210> 49
 <211> 68
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic

 <400> 49
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 ctgctggt 68

 <210> 50
 <211> 64
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic

 <400> 50
 gccacaatga agacgaccac tatgatctgg acgaggacca agatgacgaa gattctgacg 60
 acaa 64

 <210> 51
 <211> 68
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic

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 ctgctggt 68

 <210> 52
 <211> 64
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic

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acaa 64

<210> 53
<211> 68
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

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ctgctggt 68

<210> 54
<211> 64
<212> DNA
<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic

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acaa 64

<210> 55
<211> 68
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

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ctgctggt 68

<210> 56
<211> 64
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 56
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acaa 64

<210> 57
<211> 68
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 57
gacacctctaa gactgctggt gttacttctg ctcttgatac tagacctgct cctgggttcta 60
ctgctggt 68

<210> 58
<211> 64
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 58
gagattctga cgaccacaat gaagacgacc actatgatct ggacgaggac caagatgacg 60
acaa 64

<210> 59
<211> 33
<212> PRT
<213> Soybean mosaic virus

<400> 59
Asn Ile Tyr Ala Pro Ala Arg Leu Thr Ile Ala Ala Ala Asn Ser Ser
1 5 10 15
Ile Asn Ile Ala Ser Val Gly Thr Leu Tyr Ala Thr Tyr Glu Val Glu
20 25 30

Leu

<210> 60
<211> 37
<212> PRT
<213> Soybean mosaic virus

<400> 60
Asn Ile Gly Asn Ile Leu Val Pro Ala Arg Leu Val Ile Ala Met Glu
1 5 10 15
Gly Gly Ser Ser Lys Thr Ala Val Asn Thr Gly Arg Leu Tyr Ala Ser
20 25 30

Tyr Thr Ile Arg Leu
35

<210> 61
<211> 37
<212> PRT
<213> Soybean mosaic virus

<400> 61
Asn Ile Ala Thr Asp Leu Val Pro Ala Arg Leu Val Ile Ala Leu Leu
1 5 10 15
Asp Gly Ser Ser Ser Thr Ala Val Ala Ala Gly Arg Ile Tyr Ala Ser
20 25 30

Tyr Thr Ile Gln Met
35

<210> 62
 <211> 17
 <212> PRT
 <213> Lucerne transient streak virus

 <400> 62
 Ile Ala Ala Ala Asn Ser Ser Ile Asn Ile Ala Ser Val Gly Thr Leu
 1 5 10 15

 Tyr

 <210> 63
 <211> 51
 <212> DNA
 <213> Lucerne transient streak virus

 <400> 63
 atagccgcag ctaacagctc cataaacata gctagtgtgg gtactcttta t 51

 <210> 64
 <211> 51
 <212> DNA
 <213> Lucerne transient streak virus

 <400> 64
 atagctgcag ctaacagctc cataaacata gctagtgtgg gtactcttta t 51

 <210> 65
 <211> 51
 <212> DNA
 <213> Lucerne transient streak virus

 <400> 65
 atagccgcag ctaacagctc cataaacata gctagtgtgg gtacccttta t 51

 <210> 66
 <211> 16
 <212> PRT
 <213> Homo sapiens

 <400> 66
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 1 5 10 15

 <210> 67
 <211> 48
 <212> DNA
 <213> Homo sapiens

 <400> 67
 ggtgttactt ctgctcctga tactagacct gctcctgggt ctactgct 48

 <210> 68
 <211> 48
 <212> DNA
 <213> Homo sapiens

 <400> 68
 ccacaatgaa gacgaccact atgatctgga cgaggaccaa gatgacga 48

<210> 69
 <211> 83
 <212> DNA
 <213> Lucerne transient streak virus

<400> 69
 gctaacagcg gtgttacttc tgctcctgat actagacctg ctcttggttc tactgcttcc 60
 ataaacatag ctagtgtggg tac 83

<210> 70
 <211> 83
 <212> DNA
 <213> Lucerne transient streak virus

<400> 70
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 aaggtatttg tatcgatcac acc 83

<210> 71
 <211> 83
 <212> DNA
 <213> Lucerne transient streak virus

<400> 71
 gctaacagct ccggtgttac ttctgctcct gatactagac ctgctcctgg ttctactgct 60
 ataaacatag ctagtgtggg tac 83

<210> 72
 <211> 83
 <212> DNA
 <213> Lucerne transient streak virus

<400> 72
 acgtcgattg tcgaggccac aatgaagacg accactatga tctggacgag gaccaagatg 60
 acgatatttg tatcgatcac acc 83

<210> 73
 <211> 83
 <212> DNA
 <213> Lucerne transient streak virus

<400> 73
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 gctaacatag ctagtgtggg tac 83

<210> 74
 <211> 83
 <212> DNA
 <213> Lucerne transient streak virus

<400> 74
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 atgacgattg tatcgatcac acc 83

<210> 75
 <211> 83
 <212> DNA
 <213> Lucerne transient streak virus

<400> 75
gctaacagct ccataaacgg tggtacttct gctcctgata ctagacctgc tcctgggttct 60
actgctatag ctagtgtggg tac 83

<210> 76
<211> 83
<212> DNA
<213> Lucerne transient streak virus

<400> 76
acgtcgattg tcgaggtatt tgccacaatg aagacgacca ctatgatctg gacgaggacc 60
aagatgacga tatcgatcac acc 83

<210> 77
<211> 83
<212> DNA
<213> Lucerne transient streak virus

<400> 77
gctaacagct ccataaacat aggtgttact tctgctcctg atactagacc tgctcctggg 60
tctactgctg ctagtgtggg tac 83

<210> 78
<211> 83
<212> DNA
<213> Lucerne transient streak virus

<400> 78
acgtcgattg tcgaggtatt tgtatccaca atgaagacga ccactatgat ctggacgagg 60
accaagatga cgacgatcac acc 83

<210> 79
<211> 83
<212> DNA
<213> Lucerne transient streak virus

<400> 79
gctaacagct ccataaacat agctgggtgtt acttctgctc ctgatactag acctgctcct 60
ggttctactg ctagtgtggg tac 83

<210> 80
<211> 83
<212> DNA
<213> Lucerne transient streak virus

<400> 80
acgtcgattg tcgaggtatt tgtatcgacc acaatgaaga cgaccactat gatctggacg 60
aggaccaaga tgacgatcac acc 83

<210> 81
<211> 324
<212> PRT
<213> Tomato bushy stunt virus

<400> 81
Lys Lys Gln Gln Met Ile Asn His Val Gly Gly Thr Gly Gly Ala Ile
1 5 10 15

Met Ala Pro Val Ala Val Thr Arg Gln Leu Val Gly Ser Lys Pro Lys
20 25 30

Phe Thr Gly Arg Thr Ser Gly Ser Val Thr Val Thr His Arg Glu Tyr
35 40 45
Leu Ser Gln Val Asn Asn Ser Thr Gly Phe Gln Val Asn Gly Gly Ile
50 55 60
Val Gly Asn Leu Leu Gln Leu Asn Pro Leu Asn Gly Thr Leu Phe Ser
65 70 75 80
Trp Leu Pro Ala Ile Ala Ser Asn Phe Asp Gln Tyr Thr Phe Asn Ser
85 90 95
Val Val Leu His Tyr Val Pro Leu Cys Ser Thr Thr Glu Val Gly Arg
100 105 110
Val Ala Ile Tyr Phe Asp Lys Asp Ser Glu Asp Pro Glu Pro Ala Asp
115 120 125
Arg Val Glu Leu Ala Asn Tyr Ser Val Leu Lys Glu Thr Ala Pro Trp
130 135 140
Ala Glu Ala Met Leu Arg Val Pro Thr Asp Lys Ile Lys Arg Phe Cys
145 150 155 160
Asp Asp Ser Ser Thr Ser Asp His Lys Leu Ile Asp Leu Gly Gln Leu
165 170 175
Gly Ile Ala Thr Tyr Gly Gly Ala Gly Thr Asn Ala Val Gly Asp Ile
180 185 190
Phe Ile Ser Tyr Ser Val Thr Leu Tyr Phe Pro Gln Pro Thr Asn Thr
195 200 205
Leu Leu Ser Thr Arg Arg Leu Asp Leu Ala Gly Ala Leu Val Thr Ala
210 215 220
Ser Gly Pro Gly Tyr Leu Leu Val Ser Arg Thr Ala Thr Val Leu Thr
225 230 235 240
Met Thr Phe Arg Ala Thr Gly Thr Phe Val Ile Ser Gly Thr Tyr Arg
245 250 255
Cys Leu Thr Ala Thr Thr Leu Gly Leu Ala Gly Gly Val Asn Val Asn
260 265 270
Ser Ile Thr Val Val Asp Asn Ile Gly Thr Asp Ser Ala Phe Phe Ile
275 280 285
Asn Cys Thr Val Ser Asn Leu Pro Ser Val Val Thr Phe Thr Ser Thr
290 295 300
Gly Ile Thr Ser Ala Thr Val His Cys Val Arg Ala Thr Arg Gln Asn
305 310 315 320
Asp Val Ser Leu

<210> 82

<211> 331

<212> PRT

<213> Red clover necrotic mosaic virus

<400> 82

Lys Ser Lys Gln Arg Ser Gln Pro Arg Asn Arg Thr Pro Asn Thr Ser
1 5 10 15
Val Lys Thr Val Ala Ile Pro Phe Ala Lys Thr Gln Ile Ile Lys Thr
20 25 30
Val Asn Pro Pro Pro Lys Pro Ala Arg Gly Ile Leu His Thr Gln Leu
35 40 45
Val Met Ser Val Val Gly Ser Val Gln Met Arg Thr Asn Asn Gly Lys
50 55 60
Ser Asn Gln Arg Phe Arg Leu Asn Pro Ser Asn Pro Ala Leu Phe Pro
65 70 75 80
Thr Leu Ala Tyr Glu Ala Ala Asn Tyr Asp Met Tyr Arg Leu Lys Lys
85 90 95
Leu Thr Leu Arg Tyr Val Pro Leu Val Thr Val Gln Asn Ser Gly Arg
100 105 110
Val Ala Met Ile Trp Asp Pro Asp Ser Gln Asp Ser Ala Pro Gln Ser
115 120 125
Arg Gln Glu Ile Ser Ala Tyr Ser Arg Ser Val Ser Thr Ala Val Tyr
130 135 140
Glu Lys Cys Ser Leu Thr Ile Pro Ala Asp Asn Gln Trp Arg Phe Val
145 150 155 160
Ala Asp Asn Thr Thr Val Asp Arg Lys Leu Val Asp Phe Gly Gln Leu
165 170 175
Leu Phe Val Thr His Ser Gly Ser Asp Gly Ile Glu Thr Gly Asp Ile
180 185 190
Phe Leu Asp Cys Glu Val Glu Phe Lys Gly Pro Gln Pro Thr Ala Ser
195 200 205
Ile Val Gln Lys Thr Val Ile Asp Leu Gly Gly Thr Leu Thr Ser Phe
210 215 220
Glu Gly Pro Ser Tyr Leu Met Pro Pro Asp Ala Phe Ile Thr Ser Ser
225 230 235 240
Ser Phe Gly Leu Phe Val Asp Val Ala Gly Thr Tyr Leu Leu Thr Leu
245 250 255
Val Val Thr Cys Ser Thr Thr Gly Ser Val Thr Val Gly Gly Asn Ser
260 265 270
Thr Leu Val Gly Asp Gly Arg Ala Ala Tyr Gly Ser Ser Asn Tyr Ile
275 280 285
Ala Ser Ile Val Phe Thr Ser Ser Gly Val Leu Ser Thr Thr Pro Ser
290 295 300

Val Gln Phe Ser Gly Ser Ser Gly Val Ser Arg Val Gln Met Asn Ile
 305 310 315 320

Cys Arg Cys Lys Gln Gly Asn Thr Phe Ile Leu
 325 330

<210> 83
 <211> 41
 <212> PRT
 <213> Red clover necrotic mosaic virus

<400> 83
 Ala Ser Ile Val Gln Lys Thr Val Ile Asp Leu Gly Gly Thr Leu Thr
 1 5 10 15

Ser Phe Glu Gly Pro Ser Tyr Leu Met Pro Pro Asp Ala Phe Ile Thr
 20 25 30

Ser Ser Ser Phe Gly Leu Phe Val Asp
 35 40

<210> 84
 <211> 27
 <212> PRT
 <213> Red clover necrotic mosaic virus

<400> 84
 Ala Ser Ile Val Gln Lys Tyr Val Ile Asp Leu Gly Gly Thr Leu Thr
 1 5 10 15

Ser Phe Glu Gly Pro Ser Tyr Leu Met Pro Pro
 20 25

<210> 85
 <211> 17
 <212> PRT
 <213> Red clover necrotic mosaic virus

<400> 85
 Ser Ile Val Gln Lys Thr Val Ile Asp Leu Gly Gly Thr Leu Thr Ser
 1 5 10 15

Phe

<210> 86
 <211> 51
 <212> DNA
 <213> Red clover necrotic mosaic virus

<400> 86
 agcatcgtac agaaaactgt aattgatctc ggtgggacac tcacttcttt c 51

<210> 87
 <211> 51
 <212> DNA
 <213> Red clover necrotic mosaic virus

<400> 87
 agcatcgtgc acaaaaactgt aattgatctc ggtgggacac tcacttcttt c 51

<210> 88
 <211> 51
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 88
 agcatcgtac agaaaactgt aattgatctc ggtgggacgt taacttcttt c 51

 <210> 89
 <211> 16
 <212> PRT
 <213> Homo sapiens

 <400> 89
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 1 5 10 15

 <210> 90
 <211> 48
 <212> DNA
 <213> Homo sapiens

 <400> 90
 ggtgttactt ctgctcctga tactagacct gctcctgggt ctactgct 48

 <210> 91
 <211> 48
 <212> DNA
 <213> Homo sapiens

 <400> 91
 ccacaatgaa gacgaccact atgatctgga cgaggaccaa gatgacga 48

 <210> 92
 <211> 78
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 92
 gaaaactgta ggtgttactt ctgctcctga tactagacct gctcctgggt ctactgctat 60
 tgatctcggg gggacgtt 78

 <210> 93
 <211> 82
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 93
 acgtcttttg acatccacaa tgaagacgac cactatgatc tggacgagga ccaagatgac 60
 gataactaga gccaccctgc aa 82

 <210> 94
 <211> 78
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 94
 gaaaactgta attggtgtta cttctgctcc tgatactaga cctgctcctg gttctactgc 60
 tgatctcggg gggacgtt 78

<210> 95
 <211> 82
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 95
 acgtcttttg acattaacca caatgaagac gaccactatg atctggacga ggaccaagat 60
 gacgactaga gccaccctgc aa 82

 <210> 96
 <211> 78
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 96
 gaaaactgta attgatgggtg ttacttctgc tcttgatact agacctgctc ctgggttctac 60
 tgctctcggt gggacgtt 78

 <210> 97
 <211> 82
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 97
 acgtcttttg acattaacta ccacaatgaa gacgaccact atgatctgga cgaggaccaa 60
 gatgacgaga gccaccctgc aa 82

 <210> 98
 <211> 78
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 98
 gaaaactgta attgatctcg gtgttacttc tgctctgat actagacctg ctcttggttc 60
 tactgctggt gggacgtt 78

 <210> 99
 <211> 82
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 99
 acgtcttttg acattaacta gagccacaat gaagacgacc actatgatct ggacgaggac 60
 caagatgacg accaccctgc aa 82

 <210> 100
 <211> 78
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 100
 gaaaactgta attgatctcg gtgggtgttac ttctgctcct gatactagac ctgctcctgg 60
 ttctactgct gggacgtt 78

 <210> 101
 <211> 82
 <212> DNA
 <213> Red clover necrotic mosaic virus

 <400> 101
 acgtcttttg acattaacta gagccaccac aatgaagacg accactatga tctggacgag 60
 gaccaagatg acgaccctgc aa 82

<210> 102
 <211> 78
 <212> DNA
 <213> Red clover necrotic mosaic virus

<400> 102
 gaaaactgta attgatctcg gtgggggtgt tacttctgct cctgatacta gacctgctcc 60
 tggttctact gctacgtt 78

<210> 103
 <211> 82
 <212> DNA
 <213> Red clover necrotic mosaic virus

<400> 103
 acgtcttttg acattaacta gagccacccc cacaatgaag acgaccacta tgatctggac 60
 gaggaccaag atgacgatgc aa 82

<210> 104
 <211> 24
 <212> PRT
 <213> Tobacco rattle virus

<400> 104
 Ser Thr Pro Ala Ser Gly Gly Ser Gly Ala Thr Pro Pro Pro Ala Ser
 1 5 10 15
 Gly Gly Ala Val Arg Pro Asn Pro
 20

<210> 105
 <211> 107
 <212> DNA
 <213> Tobacco rattle virus

<400> 105
 cgctcgactcc ggcctcgggg ggaagtgggtg caacaccacc tcctgcgagt ggggggtgctg 60
 tgcgctcctaa tccttgatgt cgtcaaatca aacctttaag ggacctt 107

<210> 106
 <211> 19
 <212> PRT
 <213> Tobacco rattle virus

<400> 106
 Ser Thr Pro Ala Ser Gly Gly Ser Gly Ala Thr Pro Pro Pro Ala Ser
 1 5 10 15
 Gly Gly Ala

<210> 107
 <211> 84
 <212> DNA
 <213> Tobacco rattle virus

<400> 107
 tcgactccgg cctcgggggg aagtgggtgca acaccacctc ctgcgagtgg gggtgcttga 60
 tgtcgtcaaaa tcaaaccttt aagg 84

<210> 108
 <211> 82
 <212> DNA
 <213> Tobacco rattle virus

 <400> 108
 gaggccggag ccccccttca ccacgttggtg gtggaggacg ctcacccac gaactacagc 60
 agtttagttt ggaaattccc tg 82

 <210> 109
 <211> 14
 <212> PRT
 <213> Tobacco rattle virus

 <400> 109
 Ser Thr Pro Ala Ser Gly Gly Ser Gly Ala Thr Pro Pro Pro
 1 5 10

 <210> 110
 <211> 69
 <212> DNA
 <213> Tobacco rattle virus

 <400> 110
 tcgactccgg cctcgggggg aagtgggtgca acaccacctc cttgatgtcg tcaaatacaa 60
 cctttaagg 69

 <210> 111
 <211> 68
 <212> DNA
 <213> Tobacco rattle virus

 <400> 111
 gaggccggag ccccccttca ccacgttggtg gtggaggaac tacagcagtt tagtttggaa 60
 attccctg 68

 <210> 112
 <211> 9
 <212> PRT
 <213> Tobacco rattle virus

 <400> 112
 Ser Thr Pro Ala Ser Gly Gly Ser Gly
 1 5

 <210> 113
 <211> 54
 <212> DNA
 <213> Tobacco rattle virus

 <400> 113
 tcgactccgg cctcgggggg aagtgggtga tgcgtcaaa tcaaactttt aagg 54

 <210> 114
 <211> 53
 <212> DNA
 <213> Tobacco rattle virus

 <400> 114
 gaggccggag ccccccttca ccaactacag cagtttagtt tggaaattcc ctg 53

<210> 115
 <211> 4
 <212> PRT
 <213> Tobacco rattle virus

 <400> 115
 Ser Thr Pro Ala
 1

 <210> 116
 <211> 39
 <212> DNA
 <213> Tobacco rattle virus

 <400> 116
 tcgactccgg cctgatgtcg tcaaataaaa cctttaagg 39

 <210> 117
 <211> 38
 <212> DNA
 <213> Tobacco rattle virus

 <400> 117
 gaggccggac tacagcagtt tagtttgga attccctg 38

 <210> 118
 <211> 2
 <212> PRT
 <213> Tobacco rattle virus

 <400> 118
 Ser Thr
 1

 <210> 119
 <211> 33
 <212> DNA
 <213> Tobacco rattle virus

 <400> 119
 tcgacttgat gtcgtcaaat caaaccttta agg 33

 <210> 120
 <211> 32
 <212> DNA
 <213> Tobacco rattle virus

 <400> 120
 gaactacagc agtttagttt ggaaattccc tg 32

 <210> 121
 <211> 31
 <212> PRT
 <213> S. aureus

 <400> 121
 Gly Gln Asn Asn Gly Asn Gln Ser Phe Glu Glu Asp Thr Glu Lys Asp
 1 5 10 15
 Lys Pro Lys Tyr Glu Gln Gly Gly Asn Ile Ile Asp Ile Asp Phe
 20 25 30

<210> 122
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 122
ctagcatgaa ttttgacctt c 21

<210> 123
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 123
gtacttaaaa ctggaagaat t 21

AI
cons